

Claims

- [c1] 1.A method comprising the steps of:
capturing an image of an eye having an iris, the image having a plurality of measurement origins;
detecting an edge of the iris;
determining a distance from each measurement origin to the edge of the iris; and,
producing a final image when each of the determined distances is equal to respective one of a plurality of pre-determined lengths.
- [c2] 2.The method of claim 1, wherein the plurality of measurement origins comprises a corner of the image.
- [c3] 3.The method of claim 1, wherein the plurality of measurement origins comprises an edge of the image.
- [c4] 4.The method of claim 1, wherein the step of producing the final image comprises generating the captured image.
- [c5] 5.The method of claim 1, wherein the step of producing the final image occurs when each one of the plurality of predetermined lengths are approximately equal to each other.

- [c6] 6.The method of claim 1, where an eye orientation is determined by correlating a reflected light from a cornea and a lens.
- [c7] 7.The method of claim 1, further comprising the step of capturing a second final image.
- [c8] 8.The method of claim 7, wherein the final image and the second final image are captured with different parameters.
- [c9] 9.The method of claim 8, wherein the parameter is a resolution.
- [c10] 10.The method of claim 8, wherein the parameter is a size.
- [c11] 11.The method of claim 8, wherein the parameter is a wavelength.
- [c12] 12.The method of claim 1, further comprising the step of overlaying an eye feature position marker on a displayed version of the captured image.
- [c13] 13.A method comprising the steps of:
capturing an image of an eye, the eye having an iris and a pupil;
determining a size and location of one of the iris and the

pupil; and,
producing a final image if the size and location matches a predetermined size and a predetermined position, respectively.

[c14] 14.The method of claim 13, further comprising the step of capturing the final image.

[c15] 15.The method of claim 13, wherein the image comprises a plurality of pixels, and the step of determining a size and location of one of the iris and the pupil comprises the step of determining whether each of the plurality of pixels represents one of an iris pixel and a pupil pixel.

[c16] 16.A method comprising the steps of:
capturing an image of an eye, the eye including a pupil with a size;
manipulating the size of the pupil by exposing the pupil to a light starting at a first intensity level and ending at a second intensity level;
determining the size of the pupil; and,
outputting a final image when the size of the pupil matches a predetermined size.

[c17] 17.The method of claim 16, wherein the first intensity level is greater than the second intensity.

- [c18] 18. The method of claim 16, wherein the second intensity level is zero.
- [c19] 19. A method for auto-positioning and auto-triggering of a capture of an eye image:
capturing a first image of an eye having a pupil, the first image having four corners;
detecting an edge of the pupil; and,
determining a distance from each corner of the image to the edge of the pupil along two diagonal paths, each diagonal path defined by two diagonally opposing corners of the first image.
- [c20] 20. The method of claim 19, further comprising the step of producing a final image when the distance from each corner of the image to the edge of the pupil is equal to each other.
- [c21] 21. The method of claim 19, further comprising the step of adjusting a size of the pupil by varying the intensity of a visible light source.
- [c22] 22. The method of claim 21, further comprising the step of determining the size of the pupil by calculating an average darkness level in the pupil and using this average as a defining threshold for determining the area of the pupil.

- [c23] 23. A computer-readable medium having computer-executable instructions stored thereon for capturing an image of an eye having an iris, the computer-executable instructions, when executed by a computer, causes the computer to perform a method comprising the steps of: determining a plurality of measurement origins in the image;
detecting an edge of the iris;
determining a distance from each measurement origin to the edge of the iris; and,
outputting a final image when each of the determined distances is equal to respective one of a plurality of pre-determined lengths.
- [c24] 24. The computer-readable medium of claim 23, wherein the plurality of measurement origins comprises a corner of the image.
- [c25] 25. The computer-readable medium of claim 23, wherein the plurality of measurement origins comprises an edge of the image.
- [c26] 26. The computer-readable medium of claim 23, wherein the step of outputting a final image comprises outputting the captured image.
- [c27] 27. The computer-readable medium of claim 23, wherein

the step of outputting a final image occurs when each one of the plurality of predetermined lengths are equal to each other.

- [c28] 28.The computer-readable medium of claim 23, wherein the method further comprising the step of capturing a second final image.
- [c29] 29.The computer-readable medium of claim 28, wherein the final image and the second final image are captured with different parameters.
- [c30] 30.The computer-readable medium of claim 29, wherein the parameter is a resolution.
- [c31] 31.The computer-readable medium of claim 29, wherein the parameter is a size.
- [c32] 32.The computer-readable medium of claim 29, wherein the parameter is a wavelength.
- [c33] 33.The computer-readable medium of claim 23, wherein the method further comprising the step of overlaying an eye feature position marker on a displayed version of the captured image.
- [c34] 34.A computer-readable medium having computer-executable instructions stored thereon for capturing an image of an eye, the eye having an iris and a pupil, the

computer-executable instructions, when executed by a computer, causes the computer to perform a method comprising the steps of:

determining a size and location of one of the iris and the pupil;

comparing the determined size and location to a predetermined size and position; and,

outputting a final image if the size and location matches the predetermined size and position, respectively.

[c35] 35.The computer-readable medium of claim 34, wherein the method further comprises the step of capturing the final image.

[c36] 36.The computer-readable medium of claim 34, wherein the image comprises a plurality of pixels, and the step of determining a size and location of one of the iris and the pupil comprises the step of determining whether each of the plurality of pixels represents one of an iris pixel and a pupil pixel.

[c37] 37.A computer-readable medium having computer-executable instructions stored thereon for capturing an image of an eye, the eye including a pupil with a size, the computer-executable instructions, when executed by a computer, causes the computer to perform a method comprising the steps of:

manipulating the size of the pupil by exposing the pupil to a light starting at a first intensity level and ending at a second intensity level;
determining the size of the pupil; and,
outputting a final image when the size of the pupil matches a predetermined size.

[c38] 38.The computer-readable medium of claim 37, wherein the first intensity level is greater than the second intensity.

[c39] 39.The computer-readable medium of claim 37, wherein the second intensity level is zero.

[c40] 40.A computer-readable medium having computer-executable instructions stored thereon for auto-positioning and auto-triggering of a capture of an eye image, the computer-executable instructions, when executed by a computer, causes the computer to perform a method comprising the steps of:
capturing a first image of an eye having a pupil, the first image having four corners;
detecting an edge of the pupil; and,
determining a distance from each corner of the image to the edge of the pupil along two diagonal paths, each diagonal path defined by two diagonally opposing corners of the first image.

- [c41] 41.The computer-readable medium of claim 40, wherein the method further comprises the step of outputting a final image when the distance from each corner of the image to the edge of the pupil is equal to each other.
- [c42] 42.The computer-readable medium of claim 40, wherein the method further comprises the step of adjusting a size of the pupil by varying the intensity of a visible light source.
- [c43] 43.The computer-readable medium of claim 40, wherein the method further comprises the step of determining the size of the pupil by calculating an average darkness level in the pupil and using this average as a defining threshold for determining the area of the pupil.
- [c44] 44.An apparatus for capturing an image of an eye having an iris comprising:
an image sensor;
a processor coupled to the image sensor;
a memory coupled to the processor, the memory having processor-executable instructions stored thereon that, when executed by the processor, causes the processor to perform a method comprising the steps of:
determining a plurality of measurement origins in the image;

detecting an edge of the iris;
determining a distance from each measurement origin to the edge of the iris; and,
outputting a final image when each of the determined distances is equal to respective one of a plurality of pre-determined lengths.

[c45] 45.The apparatus of claim 44, wherein the plurality of measurement origins comprises a corner of the image.

[c46] 46.The apparatus of claim 44, wherein the plurality of measurement origins comprises an edge of the image.

[c47] 47.The apparatus of claim 44, wherein the step of outputting a final image comprises outputting the captured image.

[c48] 48.The apparatus of claim 44, wherein the step of outputting a final image occurs when each one of the plurality of predetermined lengths are equal to each other.

[c49] 49.The apparatus of claim 44, wherein the method further comprising the step of capturing a second final image.

[c50] 50.The apparatus of claim 49, wherein the final image and the second final image are captured with different parameters.

- [c51] 51.The apparatus of claim 50, wherein the parameter is a resolution.
- [c52] 52.The apparatus of claim 50, wherein the parameter is a size.
- [c53] 53.The apparatus of claim 50, wherein the parameter is a wavelength.
- [c54] 54.The apparatus of claim 44, wherein the method further comprising the step of overlaying an eye feature position marker on a displayed version of the captured image.